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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/413,644	10/06/1999	NEIL RICHARDS	S1022/8338	2260

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EXAMINER

PHILPOTT, JUSTIN M

ART UNIT

PAPER NUMBER

2665

DATE MAILED: 10/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/413,644

Applicant(s)

RICHARDS ET AL.

Examiner

Justin M Philpott

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/2/2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "44" (page 17, line 11) in reference to a segmentation control engine in FIG. 12. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are further objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "13" and "14" in FIG. 7. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2, 5 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2 and 10 recite the limitation “the increment variable” in claims 1 and 7, respectively. There is insufficient antecedent basis for this limitation in the claim. Applicant may overcome these rejections by changing “the increment variable” to “the selected scheduling variable”.

Claim 5 recites the limitation “the pointer variable” in claim 3. There is insufficient antecedent basis for this limitation in the claim. It appears claim 5 should be written to be dependent upon claim 4, not claim 3. Applicant may overcome this rejection by amending claim 5 to be dependent upon claim 4.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,088,355 to Mills et al. in view of U.S. Patent No. 5,533,020 to Byrn et al.

Regarding claim 1, Mills teaches a data transmission apparatus for transmitting data from a plurality of data streams over a data channel, and in particular, teaches such a system with pointer-based ATM segmentation and reassembly. However, Mills does not teach an ATM scheduler. Byrn teaches a priority-based ATM cell scheduler for a data transmission apparatus. Particularly, Byrn teaches a scheduler comprising the following:

a data stream control memory (Memory Management Unit MMU 8 in combination with memory 4 and VCA 7, see FIG. 1) for storing (via VCA 7, see col. 4, lines 55-56) a scheduling variable (e.g., VC transmission requirement corresponding to rate r , see col. 4, lines 40-43, and QOS parameters corresponding to priority p , see col. 4, lines 53-54) for each data stream, each scheduling variable (p, r) being indicative of a scheduled transmission timing (Target Transmission Time TTT, see col. 4, lines 53-59) for that data stream,

a clock (reference clock, see col. 4, line 22) for maintaining a current timing indication (Current Transmission Time CTT, see col. 4, line 21), and

a data stream selector (cell scheduling unit CSU 9 in combination with timing wheels, see col. 4, line 33 to col. 5, line 59) for, at time intervals (depending on rates r , see col. 4, lines 33-52), comparing the scheduling variables (p, r) stored in the memory and selecting the scheduling variables (p, r in the form of timing wheel $W_{p,r}$) indicative of the earliest scheduled transmission

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timing (TTT) (see col. 4 regarding CSU 9 wherein $W_{p,r}$ selection is indicative of TTT) and, if that scheduled transmission timing (TTT) is not earlier than the current timing (CTT), generating an indication of the data stream corresponding to the selected scheduling variable (see col. 6, lines 34-54, particularly lines 34-37 and 52-54, as well as col. 5, lines 4-28 and particularly lines 24-26 – wherein cells with a $TTT \leq CTT$ are serviced while the other cells of lower priority remain queued with pointers (col. 3, line 62) serving as indications of the data stream corresponding to the particular $W_{p,r}$) and incrementing the selected scheduling variable (i.e., incrementing the wheel $W_{p,r}$ according to rate r in order to examine the next highest priority queue).

The ATM cell scheduler taught by Byrn may advantageously be applied to the data transmission unit taught by Mills in order to provide an apparatus capable of improved priority-based ATM cell transmission. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the ATM scheduler of Byrn to the apparatus of Mills.

Regarding claim 2, Byrn teaches the data stream control memory (Memory Management Unit MMU 8 in combination with memory 4 and VCA 7, see FIG. 1) storing an increment variable (rate r), and to increment the selected scheduling variables (e.g., increment the position of the wheel $W_{p,r}$) the data stream selector (cell scheduling unit CSU 9 in combination with timing wheels) adds the selected scheduling variable (current position of wheel $W_{p,r}$) to the increment variable (rate r) (or rather, adds the increment variable to the selected scheduling variable) for the corresponding data stream.

Regarding claim 3, Byrn teaches at least one data memory (memory 4, see FIG. 1) for storing the data streams. As discussed above, Mills teaches a data transmission unit which

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would be obvious to retrieve the amount of data from the data memory (memory 4) before transmitting it over a data channel.

Regarding claims 4 and 5, Byrn teaches the data stream control memory storing a pointer variable for each data stream (see col. 4, lines 51-67 regarding Virtual Connection queue pointers in MMU 8), and retrieving the amount of data from the location in the data memory (memory 4) indicated by the pointer variable of the selected data stream (see col. 5, lines 42-46). Regarding claim 5, see also col. 5, lines 13-16.

Regarding claim 6, Byrn teaches a reference clock (col. 4, line 22) which anticipates the period between successive comparisons of the scheduling variables being substantially constant.

Regarding claims 7 and 8, Byrn teaches a data stream controller which provides an indication of a data stream from which to transmit data in accordance with scheduling variables $W_{p,r}$. However, it would be obvious to provide means for overriding the data stream controller in the event a particular priority and rate schedule is desired which could not be determined by the VC transmission requirements or QOS parameters (which determine p and r according to CSU 9) – i.e., such as a preset override. Regarding claim 8, a responsive transmission unit would be obvious in view of Mills.

Regarding claim 9, in the event of, for example, a preset override as discussed above, periodic comparison of the scheduling variables by the data stream selector would no longer be required for the duration of the override of the data stream selector. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to disable periodic comparison of the scheduling variables in order to conserve processing power.

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Regarding claim 10, see the above regarding claim 2 and claim 7. Furthermore, Byrn teaches means for varying the increment variables (wherein different rates r correspond to difference increment variables).

Regarding claim 11, Byrn teaches the ATM scheduler provided on a single integrated circuit (see col. 6, lines 66-67). Mills also teaches an ATM SAR device comprising a receiver, transmitter and CRC processor all within a single integrated circuit (ASIC processor, see col. 31, lines 63-65). Therefore, at the time of the invention it would be have been obvious to one of ordinary skill in the art to combine the ATM scheduler and ATM SAR (comprising the transmission apparatus, or transmitter) within a single integrated circuit in order to provide a more robust data transmission apparatus with reduced complexity.

Regarding claim 12, Mills teaches an apparatus further comprising a central processing unit (CPU, col. 33, line 65).

Regarding claim 13, see the above regarding claim 11 and claim 12.

Regarding claim 14, Mills teaches software on CPU wherein the CPU programmably controls the period between cell transmission in dependence of quality of service QOS (col. 39, lines 24-27). Byrn teaches a scheduling variable (p) dependent upon QOS (col. 4, lines 53-54). Thus, Mills in view of Byrn anticipates a CPU which further programmably controls the period between successive comparisons of scheduling variables (p) which are also dependent upon QOS.

Regarding claim 15, Mills teaches first and second non-integer-multiple clock rates (col. 3, lines 4-33) and thus, anticipates the speed of a system clock being variable. Mills further teaches the apparatus comprising a central processing unit (CPU, col. 33, line 65). Thus, at the

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time of the invention it would have been obvious to one of ordinary skill in the art to vary the speed of the clock via the central processing unit.

Regarding claim 16, while neither Mills nor Byrn teach an amount of data specifically being 384 bits, both Mills and Byrn teach ATM cell transmission-related processes. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a specific amount of data, such as 384 bits.

Regarding claim 17, Mills teaches an amount of data being transmitted together with header information (see col. 9, lines 42-63 regarding PES packet comprising stream data and identification information).

Regarding claim 18, both Mills and Byrn teach an amount of data in the form of an ATM cell.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,533,021 to Branstad et al. discloses an apparatus and method for segmentation and time synchronization of the transmission of multimedia data,

U.S. Patent No. 6,028,843 to Delp et al. discloses a cell scheduler similar to that taught by Byrn, however, with the addition of earliest deadline first scheduling, and

U.S. Patent No. 6,198,724 to Lam et al. discloses an ATM cell scheduling method and apparatus.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9314 for regular communications and 703.872.9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4750.

Justin M Philpott



October 16, 2002



HUY D. VU
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